

Art Unit 2653
Serial No. 10/080,849

PATENT
Attorney Docket No.: K35A1056

IN THE CLAIMS:

1. (Currently amended) A head stack assembly for a disk drive having a disk, the head stack assembly comprising:

a body portion;

an actuator arm cantilevered from the body portion;

a hinge, a first surface of the hinge being coupled to the actuator arm;

a load beam having a first end and a second end, the first end including a load beam surface that faces and contacts ~~being attached to~~ a second surface of the hinge, the second surface facing away from the first surface;

a gimbal coupled to the second end of the load beam, and

a slider coupled to the gimbal.

2. (Original) The head stack assembly of Claim 1, further including a mount plate attached to the actuator arm, the hinge being coupled to the actuator arm via the mount plate, the mount plate having a thickness that is greater than 0.22 mm.

3. (Original) The head stack assembly of Claim 1, wherein the hinge has a thickness that is greater than 0.05 mm.

4. (Original) The head stack assembly of Claim 1, wherein the load beam has a thickness that is greater than 0.12 mm.

5. (Currently amended) The head stack assembly of Claim 1, wherein the first surface hinge ~~includes a radius geometry that defines a first radius of curvature, a second radius~~

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~~of curvature and a third radius of curvature, the first radius being closer to the mount plate than the second radius, the second radius being closer to the mount plate than the third radius~~

a first convex portion defining a first radius of curvature, adjacent the actuator arm, and adjacent

a first concave portion of the first surface, defining a second radius of curvature, adjacent,

a second convex portion of the first surface, defining a third radius of curvature, adjacent

a second concave portion of the first surface, adjacent the first end, and wherein the third radius is greater than the second radius.

6. (Currently amended) A disk drive, comprising:

a disk having a recording surface;

a head stack assembly, including:

a body portion;

an actuator arm cantilevered from the body portion;

a hinge, a first surface of the hinge being coupled to the actuator arm;

a load beam having a first end and a second end, the first end including a load beam surface that faces and contacts ~~being attached to~~ a second surface of the hinge, the second surface facing away from the first surface;

a gimbal coupled to the second end of the load beam, and

a slider coupled to the gimbal.

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7. (Original) The disk drive of Claim 6, further including a mount plate attached to the actuator arm, the hinge being coupled to the actuator arm via the mount plate, the mount plate having a thickness that is greater than 0.22 mm.

8. (Currently amended) The disk drive of Claim 6, wherein the hinge has a thickness that is greater than 0.05 mm and the load beam has a thickness that is greater than 0.12 mm.

9. (Currently amended) The disk drive of Claim 6, wherein the ~~load beam has a thickness that is greater than 0.12 mm~~ first surface includes

a first convex portion defining a first radius of curvature, adjacent the actuator arm, and adjacent

a first concave portion of the first surface, defining a second radius of curvature, adjacent,

a second convex portion of the first surface, defining a third radius of curvature, adjacent

a second concave portion of the first surface, adjacent the first end.

10. (Currently amended) The disk drive of Claim 6 9, wherein ~~the hinge includes a radius geometry that defines a first radius of curvature, a second radius of curvature and a third radius of curvature, the first radius being closer to the mount plate than the second radius, the second radius being closer to the mount plate than the third radius, and wherein the third radius is greater than the second radius.~~

11. (Currently amended) A head gimbal assembly for a head stack assembly of a disk drive, ~~the head stack assembly including a body portion, an actuator arm cantilevered from the body portion, the disk drive having a disk, comprising:~~

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a hinge, ~~a first surface of the hinge being coupled to the actuator arm~~ having a first hinge surface and a second hinge surface;

a mount plate coupled to the first hinge surface;

a load beam having a first end and a second end, the first end including a load beam surface that faces and contacts ~~being attached to a~~ the second hinge surface of the hinge, the second hinge surface facing away from the first hinge surface;

a gimbal coupled to the second end of the load beam, and

a slider coupled to the gimbal.

12. (Original) The head gimbal assembly of Claim 11, wherein the hinge has a thickness that is greater than 0.05 mm.

13. (Original) The head gimbal assembly of Claim 11, wherein the load beam has a thickness that is greater than 0.12 mm.

14. (Original) The head gimbal assembly of Claim 11, wherein the hinge includes a radius geometry that defines a first radius of curvature, a second radius of curvature and a third radius of curvature, the first radius being closer to the mount plate than the second radius, the second radius being closer to the mount plate than the third radius, and wherein the third radius is greater than the second radius.

15. (Currently amended) A suspension for a head stack assembly of a disk drive, ~~the head stack assembly including an actuator arm and a mount plate~~, the suspension comprising:

a hinge, ~~a first surface of the hinge for coupling to the actuator arm~~ having a first hinge end and a second hinge end;

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a mount plate coupled to the first hinge end;

a load beam having a first load beam end and a second load beam end, the first load beam end being attached to a second surface of the hinge, the second surface facing away from the first surface coupled to the second hinge end; and

a gimbal coupled to the second end of the load beam end;

the hinge including a first surface having

a first convex portion defining a first radius of curvature, adjacent the first hinge end, and adjacent

a first concave portion of the first surface, defining a second radius of curvature, adjacent,

a second convex portion of the first surface, defining a third radius of curvature, adjacent

a second concave portion of the first surface, adjacent the second hinge end.

16. (Original) The suspension of Claim 15, wherein the hinge has a thickness that is greater than 0.05 mm.

17. (Original) The suspension of Claim 15, wherein the load beam has a thickness that is greater than 0.12 mm.

18. (Currently Amended) The suspension of Claim 15, wherein ~~the hinge includes a radius geometry that defines a first radius of curvature, a second radius of curvature and a third radius of curvature, the first radius being closer to the mount plate than the second radius, the second radius being closer to the mount plate than the third radius, and wherein the third radius is greater than the second radius.~~

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19. (Currently amended) ~~A suspension for a head stack assembly of a disk drive, the head stack assembly including an actuator arm and a mount plate, the disk drive having a disk, the suspension comprising:~~

~~a load beam having a first end and a second end, the first end defining an integral hinge portion, the hinge portion defining a radius geometry that includes at least two radii of curvatures configured to lower load beam toward the disk such that the hinge portion defines at least one concave portion and at least one convex portion, a first surface of the hinge portion for coupling to the actuator arm, and~~

~~a gimbal coupled to the second end of the load beam~~ The suspension of claim 15, wherein the first surface is coupled to the mount plate.

20. (Currently amended) The suspension of Claim 19, wherein the hinge portion has a thickness that is greater than 0.05 mm further comprises a second surface opposing the first surface and the second surface faces and is in contact with a surface of the load beam.

21. (Original) The suspension of Claim 19, wherein the load beam has a thickness that is greater than 0.12 mm.

22. (Currently amended) The suspension of Claim 19, wherein ~~the radius geometry includes a first radius of curvature, a second radius of curvature and a third radius of curvature, the first radius being is closer to the mount plate than the second radius, the second radius being is closer to the mount plate than the third radius, and wherein the third radius is greater than the second radius.~~

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23. (Currently amended) A head gimbal assembly for a head stack assembly of a disk drive, the head stack assembly including a body portion, an actuator arm cantilevered from the body portion, the disk drive having a disk, the head gimbal assembly comprising:

a load beam having a first end and a second end, the first end defining an integral hinge portion, the hinge portion defining a radius geometry that includes at least ~~two~~ three radii of curvatures configured to lower load beam toward the disk such that a first surface of the hinge portion defines at least ~~one~~ two concave portions and at least ~~one~~ two convex portions, ~~a~~ the first surface of the hinge portion being coupled to the actuator arm;

a gimbal coupled to the second end of the load beam, and

a slider coupled to the gimbal.

24. (Currently amended) The head gimbal assembly of Claim 23, wherein the hinge portion has a thickness that is greater than 0.05 mm.

25. (Original) The head gimbal assembly of Claim 23, wherein the load beam has a thickness that is greater than 0.12 mm.

26. (Original) The head gimbal assembly of Claim 23, wherein the radius geometry includes a first radius of curvature, a second radius of curvature and a third radius of curvature, the first radius being closer to the mount plate than the second radius, the second radius being closer to the mount plate than the third radius, and wherein the third radius is greater than the second radius.

27. (Currently amended) A head stack assembly for a disk drive having a disk, the head stack assembly comprising:

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a body portion;

an actuator arm cantilevered from the body portion;

a load beam having a first end and a second end, the first end defining an integral hinge portion, the hinge portion defining a radius geometry that includes at least ~~two~~ three radii of curvatures configured to lower load beam toward the disk such that a first surface of the hinge portion defines at least ~~one~~ two concave portions and at least ~~one~~ two convex portions, a the first surface of the hinge portion being coupled to the actuator arm;

a gimbal coupled to the second end of the load beam, and

a slider coupled to the gimbal.

28. (Currently amended) The head stack assembly of Claim 26, further including a mount plate attached to the actuator arm, the hinge portion being coupled to the actuator arm via the mount plate, the mount plate having a thickness that is greater than 0.22 mm.

29. (Currently amended) The head stack assembly of Claim 27, wherein the hinge portion has a thickness that is greater than 0.05 mm.

30. (Original) The head stack assembly of Claim 27, wherein the load beam has a thickness that is greater than 0.12 mm.

31. (Original) The head stack assembly of Claim 27, wherein the radius geometry includes a first radius of curvature, a second radius of curvature and a third radius of curvature, the first radius being closer to the mount plate than the second radius, the second radius being closer to the mount plate than the third radius, and wherein the third radius is greater than the second radius.

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32. (Currently amended) A disk drive, comprising:

a disk having a recording surface;

a head stack assembly, including:

a body portion;

an actuator arm cantilevered from the body portion;

a load beam having a first end and a second end, the first end defining an integral hinge portion, the hinge portion defining a radius geometry that includes at least ~~two~~ three radii of curvatures configured to lower load beam toward the disk such that a first surface of the hinge portion defines at least ~~one~~ two concave portions and at least ~~one~~ two convex portions, a the first surface of the hinge portion being coupled to the actuator arm;

a gimbal coupled to the second end of the load beam, and

a slider coupled to the gimbal.

33. (Currently amended) The disk drive of Claim 32, further including a mount plate attached to the actuator arm, the hinge portion being coupled to the actuator arm via the mount plate, the mount plate having a thickness that is greater than 0.22 mm.

34. (Currently amended) The disk drive of Claim 32, wherein the hinge portion has a thickness that is greater than 0.05 mm.

35. (Original) The disk drive of Claim 32, wherein the load beam has a thickness that is greater than 0.12 mm.

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36. (Original) The disk drive of Claim 32, wherein the radius geometry includes a first radius of curvature, a second radius of curvature and a third radius of curvature, the first radius being closer to the mount plate than the second radius, the second radius being closer to the mount plate than the third radius, and wherein the third radius is greater than the second radius.

37. (Currently Amended) A head stack assembly for a disk drive having a disk, the head stack assembly comprising:

a body portion;

an actuator arm cantilevered from the body portion;

a hinge defining a radius geometry, the radius geometry including at least ~~two~~ three radii of curvatures such that a first surface of the hinge defines at least one two concave portions and at least one two convex portions, the hinge being coupled to the actuator arm;

a load beam having a first end and a second end, the first end being coupled to the hinge;

a gimbal coupled to the second end of the load beam, and

a slider coupled to the gimbal.

38. (Original) The head stack assembly of Claim 37, further including a mount plate attached to the actuator arm, the hinge being coupled to the actuator arm via the mount plate, the mount plate having a thickness that is greater than 0.22 mm.

39. (Currently Amended) The head stack assembly of Claim 37, wherein the hinge ~~has a thickness that is greater than 0.05 mm~~ further comprises a second surface opposing the first surface and the second surface faces and is in contact with a surface of the load beam.

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40. (Currently Amended) The head stack assembly of Claim 37, wherein ~~the load beam has a thickness that is greater than 0.12 mm~~ the first surface faces and is in contact with a surface of the load beam.

41. (Original) The head stack assembly of Claim 37, wherein the radius geometry includes a first radius of curvature, a second radius of curvature and a third radius of curvature, the first radius being closer to the mount plate than the second radius, the second radius being closer to the mount plate than the third radius, and wherein the third radius is greater than the second radius.

42. (Currently amended) A disk drive, comprising:

a disk having a recording surface;

a head stack assembly, including:

a body portion;

an actuator arm cantilevered from the body portion;

a hinge defining a radius geometry, the radius geometry including at least ~~two~~ three radii of curvatures such that a first surface of the hinge defines at least ~~one~~ two concave portions and at least ~~one~~ two convex portions, the hinge being coupled to the actuator arm;

a load beam having a first end and a second end, the first end being coupled to the hinge;

a gimbal coupled to the second end of the load beam, and

a slider coupled to the gimbal.

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43. (Original) The disk drive of Claim 42, further including a mount plate attached to the actuator arm, the hinge being coupled to the actuator arm via the mount plate, the mount plate having a thickness that is greater than 0.22 mm.

44. (Currently amended) The disk drive of Claim 42, wherein the hinge ~~has a thickness that is greater than 0.05 mm~~ further comprises a second surface opposing the first surface and the second surface faces and is in contact with a surface of the load beam.

45. (Currently amended) The disk drive of Claim 42, wherein ~~the load beam has a thickness that is greater than 0.12 mm~~ the first surface faces and is in contact with a surface of the load beam.

46. (Original) The disk drive of Claim 42, wherein the radius geometry includes a first radius of curvature, a second radius of curvature and a third radius of curvature, the first radius being closer to the mount plate than the second radius, the second radius being closer to the mount plate than the third radius, and wherein the third radius is greater than the second radius.

47. (Currently amended) A head gimbal assembly for a head stack assembly of a disk drive, the head stack assembly including a body portion, an actuator arm cantilevered from the body portion, the disk drive having a disk, the head gimbal assembly comprising:

a hinge defining a radius geometry, the radius geometry including at least ~~two~~ three radii of curvatures such that a first surface of the hinge defines at least one two concave portions and at least ~~one~~ two convex portions, the hinge being coupled to the actuator arm;

a load beam having a first end and a second end, the first end being coupled to the hinge;

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a gimbal coupled to the second end of the load beam, and

a slider coupled to the gimbal.

48. (Currently amended) The head gimbal assembly of Claim 47, wherein the hinge ~~has a thickness that is greater than 0.05 mm~~ further comprises a second surface opposing the first surface and the second surface faces and is in contact with a surface of the load beam.

49. (Currently amended) The head gimbal assembly of Claim 47, wherein the load beam ~~has a thickness that is greater than 0.12 mm~~ first surface faces and is in contact with a surface of the load beam.

50. (Original) The head gimbal assembly of Claim 47, wherein the radius geometry includes a first radius of curvature, a second radius of curvature and a third radius of curvature, the first radius being closer to the mount plate than the second radius, the second radius being closer to the mount plate than the third radius, and wherein the third radius is greater than the second radius.

51. (Currently amended) A suspension for a head stack assembly of a disk drive, ~~the head stack assembly including an actuator arm and a mount plate, the disk drive having a disk,~~ the suspension comprising:

a hinge defining a radius geometry, the radius geometry including at least ~~two~~ three radii of curvatures such that a first surface of the hinge defines at least one two concave portions and at least one two convex portions, ~~the hinge for coupling to the actuator arm;~~

a mount plate coupled to the first surface;

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a load beam having a first end and a second end, the first end being coupled to the hinge,
and

a gimbal coupled to the second end of the load beam.

52. (Original) The suspension of Claim 51, wherein the hinge has a thickness that is greater than 0.05 mm.

53. (Original) The suspension of Claim 51, wherein the load beam has a thickness that is greater than 0.12 mm.

54. (Original) The suspension of Claim 51, wherein the radius geometry includes a first radius of curvature, a second radius of curvature and a third radius of curvature, the first radius being closer to the mount plate than the second radius, the second radius being closer to the mount plate than the third radius, and wherein the third radius is greater than the second radius.